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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/986,746	11/09/2001	James M. Minor	NOBI-001/00US	5982

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COOLEY GODWARD LLP
ATTN: PATENT GROUP
11951 FREEDOM DRIVE, SUITE 1700
ONE FREEDOM SQUARE- RESTON TOWN CENTER
RESTON, VA 20190-5061

EXAMINER

THAI, HANH B

ART UNIT

PAPER NUMBER

2163

DATE MAILED: 10/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

8

Office Action Summary

Application No.

09/986,746

Applicant(s)

MINOR, JAMES M.

Examiner

Hanh B. Thai

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on amendment filed 7/22/05.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 15-25 is/are rejected.
- 7) ☒ Claim(s) 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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This is in response to amendment filed July 22, 2005 in which claims 1-25 are pending.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments regarding the rejection under 35 U.S.C. 112, second paragraph are persuasive. Consequently, the rejection to the claims 1-25 is withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-13 and 15-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Castelaz (EP 0393541 A2) in view of Tamayo et al. (US Pub. 2002/0115070 A1).

Regarding claim 1, Castelaz discloses a method, implemented through instructions executed on a computer, for dynamically identifying clusters of related data comprising:

- determining a new position for said probe in said M-dimensional space based on a function that processes the current position of said probe relative to at least a portion of said plurality of data points in said M-dimensional space (see abstract; summary and pages 3-4 and page 5, Castelaz discloses the data points' movement from one location to another location in two-dimensional data space based on the attractive force function);
- moving said probe from said current position to said new position (see abstract; summary and pages 3-4 and page 5, Castelaz);

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- repeating said determining a new position for said probe until said new position and said current position are approximately a same position (see abstract; summary and pages 3-4 and page 5, Castelaz);
- dynamically identifying a cluster upon determining said same position in said M-dimensional space (see abstract; summary and pages 3-4 and page 5, Castelaz).

Castelaz, however, does not explicitly disclose launching a probe from a first position in an M-dimensional space, said M-dimensional space having a plurality of data points, each of said plurality of data points associated with a data record, each data record having at least M number of data fields.

Tamayo discloses a method for analyzing gene expression data including launching a probe in dimensional space having data points associated with a data record and data fields (see paragraphs [0043]; [0057]-[0058]; [0078] and [0207], Tamayo).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to utilize the data points with data record and data fields of Tamayo into the clustering method of Castelaz because it would provide a useful technique for analyzing a large data sets (see paragraph [0003], Tamayo).

Regarding claim 2, Castelaz/Tamayo combination discloses the method of claim 1, further comprising launching another probe from another position in said M-dimensional space to initiate identification of another cluster in said M-dimensional space (Fig.1; pages 3-4 and page 5, Castelaz).

Regarding claim 3, Castelaz/Tamayo combination discloses the method of claim 1, wherein said launching another probe from another position comprises randomly determining said another position in said M-dimensional space (pages 3-4 and page 5, Castelaz).

Regarding claim 4, Castelaz/Tamayo combination discloses the method of claim 1, wherein said launching another probe from another position comprises determining said another position in said M-dimensional space outside a predetermined proximity from a previous probe trajectory (paragraphs [0020]-[0022] and [0038], Tamayo).

Regarding claim 5, Castelaz/Tamayo combination discloses the method of claim 1, wherein said launching another probe from another position comprises determining said another position in said M-dimensional space beyond a predetermined proximity from said identified cluster (paragraphs [0020]-[0022] and [0038], Tamayo).

Regarding claim 6, Castelaz/Tamayo combination discloses the method of claim 1, wherein said launching another probe from another position comprises determining said another position as one of said plurality of data points (abstract; summary and pages 3-4 and page 5, Castelaz).

Regarding claim 7, Castelaz/Tamayo combination discloses the method of claim 1, wherein said launching another probe from another position comprises determining said another position in said M-dimensional space as one of said plurality of data points that is outside of a predetermined proximity from a previous probe trajectory and beyond a predetermined proximity from said identified cluster (paragraph [0038], Tamayo).

Regarding claim 8, Castelaz/Tamayo combination discloses the method of claim 1, wherein said determining a new position for said probe comprises applying a localized force

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function to said probe (abstract; summary and pages 3-4 and page 5, Castelaz discloses the data points' movement from one location to another location in two-dimensional data space based on the attractive force function. Therefore, It is obvious to use any function to the probe as claimed).

Regarding claim 9, Castelaz/Tamayo combination discloses the method of claim 8, wherein said determining a new position for said probe comprises applying a localized Coulomb force function to said probe (abstract; summary and pages 3-4 and page 5, Castelaz discloses the data points' movement from one location to another location in two-dimensional data space based on the attractive force function. Therefore, It is obvious to use Coulomb force function to the probe).

Regarding claim 10, Castelaz/Tamayo combination discloses the method of claim 8, wherein said determining a new position for said probe comprises applying a localized force function to said probe, said force function-based on a radial distance between said probe and each of said plurality of data points (paragraphs [0052]-[0053], Tamayo).

Regarding claim 11, Castelaz/Tamayo combination discloses the method of claim 8, wherein said determining a new position for said probe comprises applying a potential function to said probe (abstract; summary and pages 3-4 and page 5, Castelaz discloses the data points' movement from one location to another location in two-dimensional data space based on the attractive force function. Therefore, It is obvious to use potential function to the probe).

Regarding claim 12, Castelaz/Tamayo combination discloses the method of claim 8, wherein said determining a new position for said probe comprises applying a potential function to said probe, said potential function based on at least one of a weight function and a quadratic function (abstract; summary and pages 3-4 and page 5, Castelaz discloses the data points' movement from one location to another location in two-dimensional data space based on the attractive force function. Therefore, It is obvious to use potential function to the probe).

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movement from one location to another location in two-dimensional data space based on the attractive force function. Therefore, It is obvious to use any function to the probe).

Regarding claim 13, Castelaz/Tamayo combination discloses the method of claim 12, wherein said applying a potential function to said probe comprises applying a product of a weight function and a quadratic function (paragraphs [0043]-[0047], Tamayo).

Regarding claim 15, Castelaz/Tamayo combination discloses the method of claim 11, further comprising minimizing a sum of said potential functions applied to each of said at least a portion of said plurality of data points (pages 3-4 and page 5, Castelaz).

Regarding claim 16, Castelaz/Tamayo combination discloses the method of claim 15, wherein said minimizing a sum of said potential functions comprises minimizing a sum of said potential functions applied to each of said plurality of data points (pages 3-4 and page 5, Castelaz).

Regarding claim 17, Castelaz discloses a method, implemented through instructions executed on a computer, for dynamically identifying the data represented as N data points in an M-dimensional space where M is less than or equal to a number of the plurality of data fields and N is less than or equal to a number of the plurality of data records, the method comprising:

- initializing a current position of a data probe as a first position in the M-dimensional space (see abstract; summary and pages 3-4 and page 5, Castelaz);
- determining a new position for said data probe in the M-dimensional space based on a function that processes the similarity between said data probe as indicated by said current position and at least a portion of the N data points in

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the M-dimensional space (see abstract; summary and pages 3-4 and page 5, Castelaz);

- adjusting said current position of said data probe to said new position (see abstract; summary and pages 3-4 and page 5, Castelaz);
- repeating said determining a new position and said adjusting said current position until said new position and said current position are approximately a same position (see abstract; summary and pages 3-4 and page 5, Castelaz discloses the data points' movement from one location to another location based on the attractive force function); and
- once said new position and said current position are approximately said same position, incrementing a count of the number of clusters of related data (see abstract; summary and pages 3-4 and page 5, Castelaz).

Castelaz, however, does not explicitly disclose a number of clusters of related data from a plurality of data records each having a plurality of data fields.

Tamayo discloses a method for analyzing gene expression data including launching a probe in dimensional space having data points associated with a data record and data fields (see paragraphs [0043];[0057]-[0058]; [0078] and [0207], Tamayo).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to utilize the data points with data record and data fields of Tamayo into the clustering method of Castelaz because it would provide a useful technique for analyzing a large data sets (see paragraph [0003], Tamayo).

Regarding claim 18, Castelaz/Tamayo combination discloses the method of claim 17, further comprising: reinitializing a current position of said data probe as a second position in the M-dimensional space, said second position different from said first position (pages 3-4 and page 5, Castelaz).

Regarding claim 19, Castelaz/Tamayo combination discloses the method of claim 18, further comprising: repeating said determining a new position and said adjusting said current position until said new position and said current position are approximately a second same position (pages 4-5, Castelaz).

Regarding claim 20, Castelaz/Tamayo combination discloses the method of claim 19, further comprising: if said second same position is a unique same position, then incrementing said count of the number of clusters of related data (pages 4-5, Castelaz).

Regarding claim 21, Castelaz/Tamayo combination discloses the method of claim 18, wherein said reinitializing a current position of said data probe as a second position comprises selecting said second position as one of said plurality of data points (paragraph [0027], Tamayo discloses the probe's position).

Regarding claim 22, Castelaz/Tamayo combination discloses the method of claim 18, wherein said reinitializing a current position of said data probe as a second position comprises selecting said second position from one of said N data points (paragraph [0027] and [0052]-[0053], Tamayo).

Regarding claim 23, Castelaz/Tamayo combination discloses the method of claim 18, wherein said reinitializing a current position of said data probe as a second position comprises

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selecting said second position from outside a previous probe trajectory (paragraph [0027] and [0052]-[0053], Tamayo).

Regarding claim 24, Castelaz/Tamayo combination discloses the method of claim 17, wherein said determining a new position for said data probe in said M-dimensional space comprises determining a relative distance between said data probe and one of the N data points (paragraphs [0052]-[0053], Tamayo).

Regarding claim 25, Castelaz/Tamayo combination discloses the method of claim 17, wherein said determining a new position for said data probe in said M-dimensional space comprises determining a relative distance between said data probe and each of said at least a portion of the N data points (paragraphs [0052]-[0053], Tamayo).

Allowable Subject Matter

3. Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance: "applying a potential function to said probe comprises applying a potential function of the form $V = R^2 \cdot \exp(-R^2/\sigma^2)$, where "V" is the potential between said probe and one of said plurality of data points, "R" is the distance in said M-dimensional space between said probe and said one of said plurality of data points, and σ^2 is an estimate of noise variance associated with said plurality of data points".

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bassett, Jr. et al. (US 6,847,897 B1) disclose method and system for analyzing biological response signal data.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hanh B. Thai whose telephone number is 571-272-4029. The examiner can normally be reached on 8 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Safet Metjahic can be reached on 571-272-4023. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hanh B Thai
Examiner
Art Unit 2163

October 11, 2005


UYEN LE
PRIMARY EXAMINER